

ASTRAGALUS SECTION DESPERATI (LEGUMINOSAE) AND A NEW SPECIES FROM THE UINTA BASIN OF UTAH

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In the course of recent field studies in the Uinta Basin and in Emery County, Utah, specimens were taken which add to the total knowledge of the species placed in the section *Desperati* of the genus *Astragalus*. These additions, along with other changes within the section, which have accrued since the publication of the monumental "Atlas of North American Species of *Astragalus*" (Barneby, 1964), require that the section be expanded to accommodate the new taxa and new information. The section consists of a suite of eight taxa in two subsections, *Desperati* and *Naturitenses*. The constituent taxa are specialized species of sandstone crevices, rimrock depressions, and sand or sandy gravels of eastern Utah, western Colorado, and northern Arizona. The first named taxon of this series of delightful narrow endemics was *Astragalus desperatus* by M. E. Jones (1891). At the time of publication of Jones' (1923) revision of *Astragalus*, he was acquainted with only three of the taxa currently known. Jones (1923) had misinterpreted material of *A. naturitensis* taken from along McElmo Creek in Colorado as *A. arientinus* var. *stipularis*. *Astragalus naturitensis* was named by E. B. Payson, and was thought by Jones to be *A. desperatus*. *Astragalus desperatus* var. *petrophilus* was described by Jones (1923) on the basis of specimens from the San Rafael Swell region of Utah. *Astragalus deterior* and *A. monumentalis* were named by Barneby (1953) on the basis of specimens taken from the Mesa Verde in Colorado and along White Canyon in Utah respectively. Barneby had earlier (1948) named *A. desperatus* var. *conspectus* based on materials from Navajo County, Arizona. This taxon was elevated to specific rank by Welsh and Atwood (Welsh, Atwood, & Reveal, 1975) as *A. barnebyi*. Segregated from *A. monumentalis* in a broad sense was *A. cottamii* Welsh (1970). Because of lack of materials of a definitive nature *A. desperatus* var. *petrophilus* was included within an expanded *A. desperatus* by Barneby (1964).

To this remarkable assemblage of plants belongs yet another species. The populations occur in the vicinity of Horseshoe Bend east of the Green River south of Vernal, Utah, where they grow on Pleiocene to Quaternary river terrace sands and gravels overlying

the Duchesne River Formation. The plants are short-lived small perennials bearing few to several scapose inflorescences carried well above the sparingly branched acaulescent to subcaulescent stems and strigose leaves. This novelty, *Astragalus equisolensis*, shares features with members of the section *Desperati*, subsection *Desperati*.

Segregation and reevaluation of taxa belonging to the section *Desperati* since 1964 has produced a need for an overview of the group. The publication by Welsh (1978) on Utah legumes is likewise dated by this discovery. The following summary key will provide such an overview, awaiting a more definitive treatment.

ASTRAGALUS L. SECTION DESPERATI BARNEBY

1. Pods dorsiventrally compressed, declined or deflexed, hirsute with spreading lustrous hairs (subsection *Desperati*) . . . 2.
2. Calyx 3.5–6 mm long, the tube campanulate, 2.5–4 mm long; flowers 6–11 mm long 3.
3. Pods lunately curved, at maturity mainly 11–19 mm long; plants commonly shortly caulescent; racemes mainly with 6–28 flowers; widespread from west-central Colorado through southeastern Utah and north-central Arizona *A. desperatus* Jones var. *desperatus*
3. Pods straight or nearly so, at maturity 6–11 mm long; plants commonly acaulescent; racemes mainly with 3–6 flowers; northern and northwestern San Rafael Swell, Emery Co., Utah *A. desperatus* var. *pertrophilus* Jones
2. Calyx 6–8.5 mm long, the tube short-cylindric, 4.5–6.5 mm long; flowers 12–16 mm long 4.
4. Plants 5–15 cm tall, not pulvinate-caespitose; racemes usually with more than 8 flowers per raceme, the axis 1.5–7 cm long in fruit; Uintah Co., Utah
. *A. equisolensis* Neese & Welsh
4. Plants 1.5–5 cm tall, pulvinate-caespitose; racemes 2- to 8-flowered, the axis 0.5–2.5 cm long in fruit; Navajo and Coconino counties, Arizona and Wayne and Garfield counties, Utah *A. barnebyi* Welsh & Atwood
1. Pods dorsiventrally or trigonously compressed, ascending, strigose to strigulose with appressed hairs (subsection *Naturitenses*) 5.

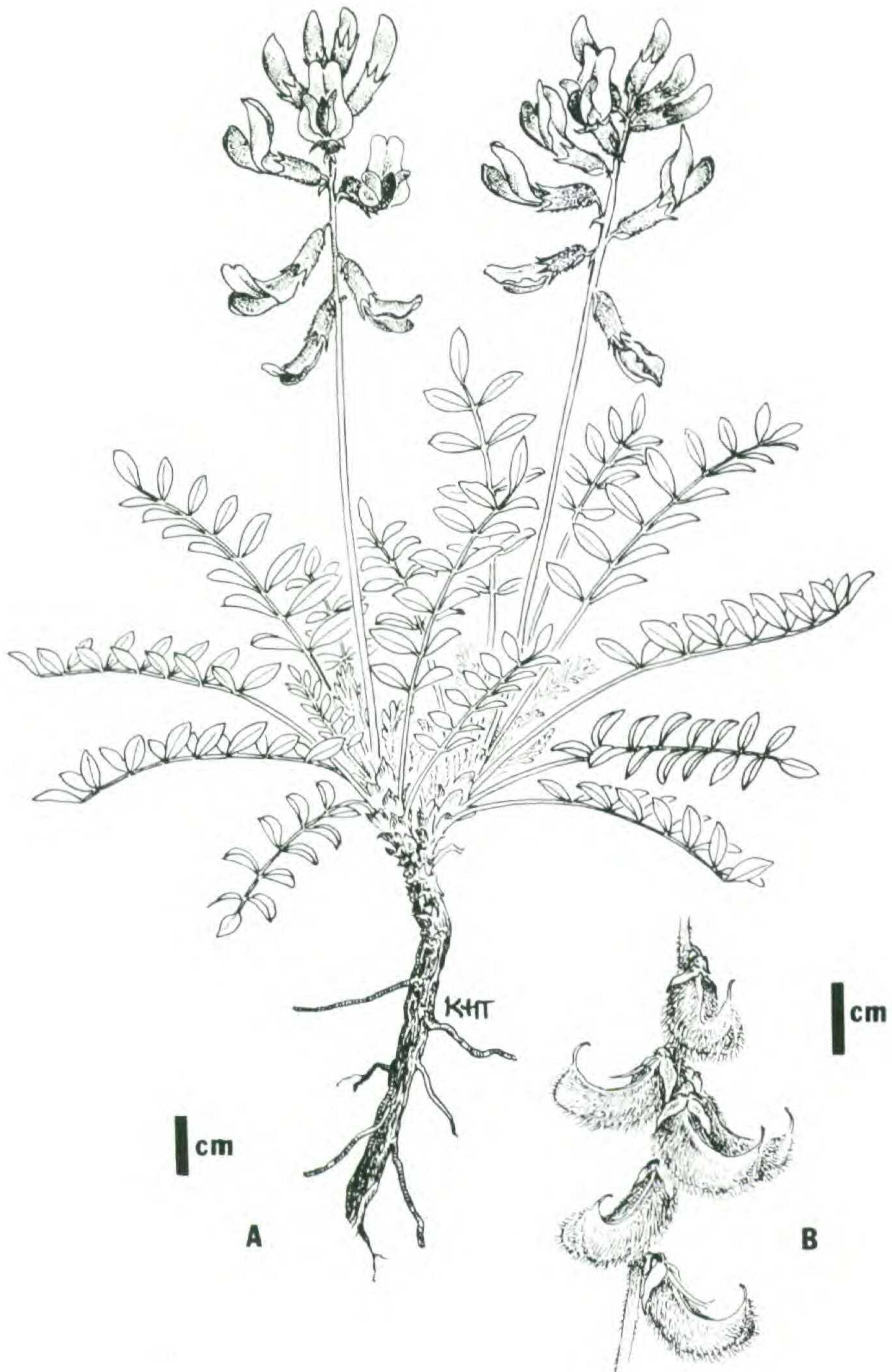
5. Stipules connate, at least the lowermost; calyx tube 3–3.5 mm long; petals ochroleucous, tinged purplish; ovules 8–10; from Mesa Verde, Montezuma Co., Colorado
 *A. deterior* Barneby
5. Stipules all distinct; calyx tube 3–6.7 mm long; petals pink-purple or white tipped with purple; ovules 16–31; distribution otherwise 6.
6. Pods narrowly ellipsoid, dorsiventrally compressed, only semi-bilocular; plants of Montrose, Sam Miguel and Montezuma counties, Colorado *A. naturitensis* Payson
6. Pods narrowly oblong in outline, compress-triquetrous, bilocular or nearly so; plants of Utah and Arizona 7.
7. Calyx tube cylindrical, 4.8–6.7 mm long; flowers 11–17 mm long; pods 20–25 mm long, conspicuously arcuate; plants of central to south-central San Juan County, Utah and northern Navajo County, Arizona *A. cottamii* Welsh
7. Calyx tube campanulate, 3–3.5 mm long; flowers 8–9 mm long; pods 12–21 mm long, straight to somewhat curved; plants of San Juan and Garfield counties, Utah *A. monumentalis* Barneby

The discovery of *A. equisolensis* in the Uinta Basin of Utah extends the known area of distribution of members of the section northward, out of the Navajo Basin. The extension seems logical when one considers that the locality of this previously unknown taxon is remote from the nearest populations of *A. desperatus* by only about 145 km. The specific epithet was chosen in reference to the area from which the species was discovered.

Astragalus equisolensis* Neese & Welsh *sp. nov.

Ab *Astragalo desperato* M. E. Jones differt floribus majoribus calyce cylindraceo et habitu stricto; e *A. barnebyi* Welsh differt calyce brevioris et latioris habitu stricto et elatioris pedunculis longioribus et inflorescentiis longioribus et leguminibus hirsutis paucioribus.

Plantae perennes acaulescentes vel subacaulescentes, 5–15 cm altae, caudicibus ramificantibus enascentibus; pubescentiae basifixae; stipulae 2–5 cm longae; folia 1.5–9 cm longa; foliola 5–17, 3–12 mm longa 1.5–5 mm lata elliptica oblanceolata vel obovata acuta vel obtusa utrinque strigosa; pedunculi strictissimi 2–9 cm



Astragalus equisolensis Neese & Welsh A. Habit of growth B. Fruit

longi; racemi 4–13 floribus, floribus adscendentibus vel patentibus ad anthesin, axibus 1.5–7 cm longis in fructum; bracteae 2–4.5 mm longae; pedicelli 0.5–2 mm longi; bracteolae nullae; calyx 6–8.5 mm longus tubo 4.5–6 mm longo cylindraco strigoso dentibus 1.2–2.5 mm longis subulatis; flores 12–16 mm longi purpurei; legumina declinata vel deflexa sessilia vel substipitata oblique ovoidea vel lance-ellipsoidea lunate curva dorsali-ventraliter compressa, distaliter constricta ad rostrum laterale compressa incurva, 10–14 mm longa, 3.5–6.5 mm lata, hirsuta unilocularia valvis crasse papyraceis; ovula 20.

HOLOTYPE: Utah, Uintah Co., T6S, R22E, SE $\frac{1}{4}$ of Sec. 29, 4.8 km south of the Green River, 5.6 km west of Walker Hollow road, 1580 m elev., mixed desert shrub community, Duchesne River Formation, silty sand, *Neese & Welsh 7380*, 27 May 1979 (BRY; 6 isotypes to be distributed).

PARATYPES: Utah, Uintah Co., T7S, R22E, Sec. 4, near Horseshoe Bend, 3.2 km east of Baser Wash, 1525 m elev., sagebrush-shadscale community, Duchesne River Formation, *Neese 4313*, 1 May 1978 (BRY); T6S, R22E, Sec. 29–30, ca. 14.5 km southwest of Jensen, Horseshoe Bend vicinity, 1460–1525 m elev., salt desert shrub community, Duchesne River Formation, *Neese et al. 7251*, 17 May 1979 (BRY); T6S, R21E, Sec. 23, meander spur north of Horseshoe Bend, ca. 17.7 km west-southwest of Jensen, ca. 1450 m elev., on terrace gravels, *Neese et al. 7254*, 17 May 1979 (BRY); T6S, R22E, SE $\frac{1}{4}$ of Sec. 29, 4.8 km south of the Green River, 5.6 km west of Walker Hollow road, 1580 m elev., mixed desert shrub community, Duchesne River Formation, silty sand, *Neese & Welsh 8278*, 10 August 1979 (BRY).

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